Vasquez Boulevard and Interstate 70 Superfund Site Operable Unit 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION 8 • JANUARY

DRAFT Proposed Plan for Public Comment

Introduction

The U.S. Environmental Protection Agency (EPA) and the State of Colorado invite the public to review and comment on a proposed plan to address contaminants located within Operable Unit 2 (OU2) of the Vasquez Boulevard and Interstate 70 Superfund Site (VB/I-70), in Denver.

This proposed plan explains EPA's and the State's proposed remedy for contaminated soil at the site. This plan also provides a summary of cleanup alternatives evaluated for use at the site. This document is issued by EPA Region 8, the lead agency for the proposed plan and decision document, and the Colorado Department of Public Health and the Environment (CDPHE), the support agency. The City and County of Denver conducted the remedial investigation and feasibility study.

In an effort to help you better understand the plan, page 12 provides a list of commonly used environmental terms that appear in ***bold*** *throughout this proposed plan.*

EPA is asking the public to review the site documents and provide comments on the proposed cleanup plan as well as other alternatives considered. EPA, in consultation with CDPHE, will select a final remedy for the site after reviewing and considering all information submitted during the 30-day public comment period. Public Involvement, review, and feedback are encouraged on all of the alternatives under consideration for Operable Unit 2 of the VB/I-70 Site.

EPA and CDPHE will host a public comment period and public meeting to explain the proposed plan and to accept comments (please see details in box above). EPA, in consultation with CDPHE, will review and consider all comments received during the public comment period. EPA and CDPHE may select the preferred cleanup alternative, modify it, select another response action, or

Opportunity for Public Comment

Public Meeting Invitation
XXday, xxx, 2010? at 6:30 pm
Place TBD

Public Comment Period
xxx xx, 2010-xxx xx, 2010?

Send Written Comments to:

Sam Garcia, EPA Project Manager
U.S. EPA Region 8 (EPR-SR)
1595 Wynkoop Street
Denver, CO 80202-1129
E-mail: garcia.sam@epa.gov

Written comments will be accepted and must be postmarked or sent by e-mail by close of business on xxx xx, 2010. Requests for an extension of the comment period must be made in writing to Sam Garcia at the above address and received by 5:00 pm on xxx xx, 2010.

Documents regarding VB/I-70 OU2 are available to the public at the following places:

Valdez-Perry Library
4690 Vine Street
Denver, CO 80216
720-865-0300

EPA Superfund Records Center
1595 Wynkoop Street
Denver, CO 80202-1129
303-312-6473

epa.gov/region8/superfund/co/vbi70/

Questions? Contact:

Jennifer H. Lane
EPA Community Involvement Coordinator
303-312-6813
800-227-8917, ext 312-6813 (toll free Region 8)
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develop other alternatives if public comment warrants or if new material is presented.

Understanding the Superfund Process

Release of the proposed plan is part of a detailed process that includes everything from site discovery through cleanup (Exhibit 1).

The **remedial investigation (RI) and feasibility study (FS)** for OU2 were completed in May and August 2010. These documents are prepared concurrently, as data collected during the investigation influences development of remedial alternatives in the FS. The RI characterizes the site conditions, determines the nature and extent of the waste, and assesses risk to human health and the environment.

The **FS** identifies, develops, screens, and evaluates remedial alternatives to address risks to human health and the environment from contaminated soil.

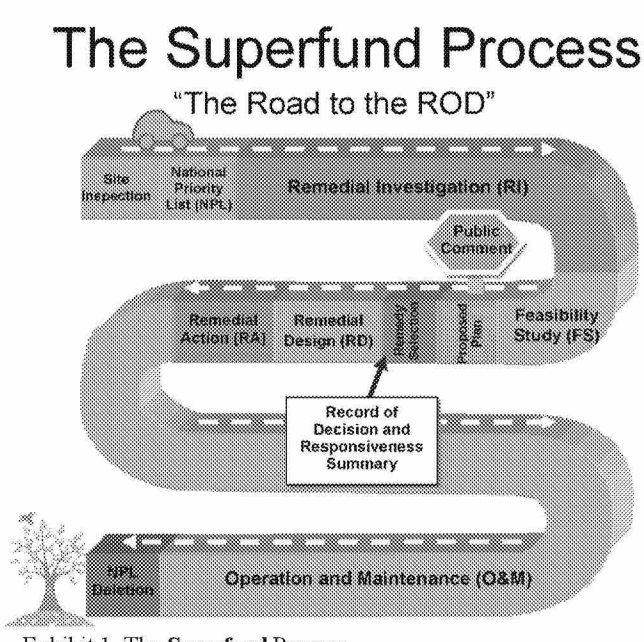

Exhibit 1. The **Superfund** Process

- The general **FS** process follows the steps summarized in the following bullets:
- Identify **remedial action objectives (RAOs)**;
- Identify and screen potential remedial technologies that will satisfy RAOs;
- Assemble remedial alternatives that can provide protection of human health and the environment from the retained remedial technologies;
- Screen the alternatives based on effectiveness, implementability and cost; and
- For alternatives that make it through the screening process, conduct a detailed analysis against seven of nine evaluation criteria (the two threshold criteria and the five primary balancing criteria) and a comparison between alternatives.

After the FS is finalized, a preferred alternative for the site is presented to the public in a **proposed plan** (this document). The **proposed plan** briefly summarizes the alternatives studied in the detailed analysis phase of the RI/FS and, highlights the key factors that led to identifying the preferred alternative. The 30-day public comment period allows the State of Colorado and the community to provide comment on the preferred alternative.

The final phase of the RI/FS process is to prepare a **Record of Decision (ROD)**. Following the receipt and evaluation of public comments and any final comments from DEQ, EPA selects and documents the remedy for the site in a ROD.

Site Background

The VB/I-70 site is an area of approximately four square miles located in north-central Denver. Historically, this area was a major smelting center for the Rocky Mountain West. Three smelting plants: Omaha-Grant, Argo, and Globe operated in the area for varying lengths of time, beginning as early as 1870, refining gold, silver, copper, lead, and zinc. On July 22, 1999 the VB/I70 site was listed on the EPA Superfund National Priorities List (NPL).

Operable Unit 2. (OU2) encompasses approximately 50 acres of the original Omaha & Grant Smelter facility and includes a portion of the Globeville Landing Park. The site is generally bound by I-70 on the north, the South Platte River on the west, Brighton Boulevard on the east, the southern boundaries of the Globeville Landing Park, and the Pepsi Bottling Company property on the south.

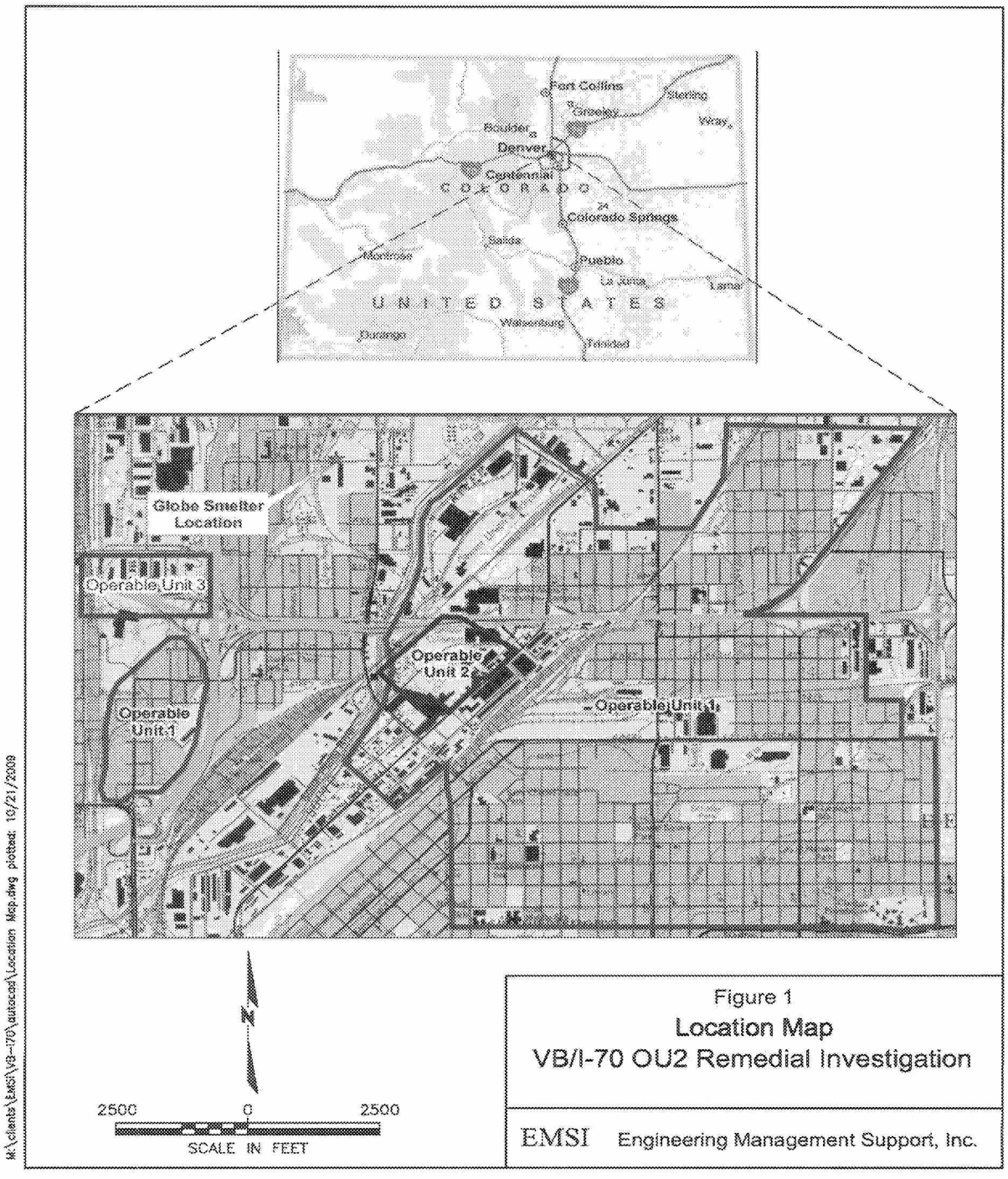

Figure 1
Location Map
VB/I-70 OU2 Remedial Investigation

EMSI Engineering Management Support, Inc.

OU2 Area History

The Omaha & Grant Smelter got its start as the Grant Smelter located in Leadville, Colorado. The Grant Smelter operated in Leadville from 1878 until 1882 and was owned by the Grant Smelting Company. When the Grant Smelter was destroyed by fire in 1882, a replacement smelter was built in Denver. The Grant Smelter merged with the Omaha Smelting Works July 15, 1883 and the corporation was renamed the Omaha & Grant Smelting and Refining Company July 18, 1902 ????? (confirm date).

In 1899, the Omaha & Grant Smelting and Refining Company joined other smelting companies to form the American Smelting and Refining Company. The company continued to operate the Omaha & Grant Smelter until 1903. The American Smelt-

ing and Refining Company changed its name to ASARCO Incorporated (ASARCO) on May 15, 1975.

Facility Operations

The Omaha & Grant Smelter facility began operation at OU2 in October 1882. In 1887, the facility was expanded. The facility expanded again in 1892, and a 352 foot-tall smelter stack was built. The smelter operated for approximately 21 years and was closed in 1903. The smelter buildings were subsequently demolished once the smelter operation was closed. Sometime later all of the slag, with the exception of any residual slag that could be buried under modern parking lots, was removed. Based on historical aerial photographs, all of the visible slag was removed by 1949. Between 1920 and 1940, various portions of the facility were deeded to the City and County of Denver. Other portions of the facility have been, and continue to be, owned or operated by the Union Pacific Railroad, the Pepsi Bottling Company and various other corporate entities or individuals.

The City and County of Denver constructed the Denver Stadium and Coliseum about 1950. Prior to constructing the coliseum and associated parking lot, portions of OU2 were used as a landfill for disposal of construction debris and possibly municipal solid wastes. The presence of landfill materials beneath the coliseum parking lot area is evidenced by the undulating nature of the parking lot pavement. This has resulted in different compaction and decomposition of the underlying materials. No specific information or documentation of the time period when the landfill was active could be located.

The properties still owned and used by CCoD are the Globeville Landing Park and the Denver Coliseum. The CCoD completed construction of the Denver Coliseum in 1952 which encompassed the northeast portion of the former Omaha and Grant Smelter facility. The approximately 10-acre Globeville Landing Park is located along the east side of the South Platte River. The park, constructed in the 1970s, encompassed part of the southwest portion of the former Omaha & Grant Smelter.

Site Characteristics

Previous investigations by EPA identified levels of arsenic and lead in soil at concentrations above human health screening levels. Therefore, the focus of the RI was on assessment of arsenic and lead occurrences in surface and subsurface soil.

Previous groundwater sampling conducted by CCoD on four out of five monitoring wells indicate arsenic and lead are below state and federal drinking water standards. One monitoring well was never developed properly and data was of questionable quality. NOTE: Add a more conclusive statement about groundwater here.

Neither arsenic nor lead were detected at elevated levels in the upstream or downstream surface water or sediment in the South Platte River adjacent to OU2 proving no impact to the river. Other than the South Platte River, there are no major surface water bodies within OU2. Draining in the OU2 area is largely controlled by man-mad features such as ditches, roads, and storm sewers.

The occurrence of arsenic and lead in soil at concentrations greater than background levels are localized and discontinuous. Sample results indicated only isolated areas of contamination containing concentrations of arsenic and lead above background levels. Since buildings and pavement in the area reduce erosion, windblown dust, and storm water runoff, significant transport and migration of arsenic and lead from the soil is not expected to occur.

EPA also investigated an area of the coliseum parking lot that was thought to have been used as a landfill for construction debris. The study characterized the nature and extent of wastes and assessed the possibility of chemical migration. Results of the laboratory analyses indicated . . . Overall, leaching of landfill contaminants is not expected to be a significant means of transporting chemicals at the site and based on current information . . .?????? (need a conclusive statement here)

Summary of Site Risks

As part of the Remedial Investigation, the EPA completed a Baseline Human Health and Screening Level Ecological Risk Assessment for OU2 to

estimate the current and future risk of site-related metals on human health and the environment.

Human Exposure Pathways

The Human Health Risk Assessment looked at potential risk to 1) current or future commercial workers; 2) construction workers; 3) recreational visitors; and 4) future residents. The assessment identified the primary exposure pathways to be incidental ingestion of surface and subsurface soil, surface water, or sediment.

Even though few people intentionally ingest soil, commercial workers, construction workers and residents who have direct contact with soil at OU2 might ingest small amounts that adhere to their hands during outdoor activities. In addition, soil can enter buildings (such as workplaces or residences) leading to contamination of indoor dust, which also may be ingested by hand-to-mouth activities. Although exposure of commercial workers to surface soil is largely prevented by the high degree of building and pavement cover at OU2, future land owners at the site could potentially remove existing buildings or pavement and expose the underlying surface soils. Construction workers also could be exposed now or in the future as a consequence of excavation activities such as installation or repair of utility lines, building foundations, or other similar activities. If in the future OU2 were redeveloped for residential use, hypothetical future residents could be exposed to surface soil at the site.

On-Site Recreational Visitors

Recreational visitors that picnic, walk or bike at the Globeville Landing Park might have direct contact with surface soil leading to potential ingestion or dermal exposure. However, the soils in the park area are mainly clean fill that was brought in from other areas during park construction, so evaluation of this pathway was not needed in the risk assessment.

Ecological Risks

A Screening Level Ecological Risk Assessment (SLERA) was conducted by EPA in 2009. This risk assessment qualitatively evaluated potential exposures of plants to trace metals in surface and subsurface soil, and aquatic receptors (fish, benthic macro invertebrates and amphibians) to trace

Arsenic

Arsenic is a naturally occurring element widely distributed in the earth's crust. Arsenic cannot be destroyed in the environment; it can only change its form. Environmental exposure can occur through ingestion of food and/or water and by breathing in dust that contains arsenic.

Several studies have shown that inorganic arsenic can increase the risk of lung, skin, bladder, liver, kidney and prostate cancers. Symptoms of short-term high-level arsenic poisoning in humans are nausea, loss of appetite, vomiting, abdominal pain, and diarrhea. General symptoms of long-term, arsenic poisoning are weakness, exhaustion, loss of appetite, loss of hair, hoarseness of voice, loss of weight and mental disorders. Primary target organs are the skin and nervous and vascular systems.

Cadmium

Cadmium is a natural element in the earths crust. All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Cadmium does not corrode easily and has many uses including batteries, pigments, metal coatings, and plastics. Environmental exposure can occur through ingestion or inhalation. Breathing high levels of cadmium severely damages the lungs and can cause death. Eating food or drinking water with very high levels severely irritates the stomach, leading to vomiting and diarrhea. Long-term exposure to lower levels of cadmium in air, food or water leads to a buildup of cadmium in the kidneys and possible kidney disease. Other long-term effects are lung damage and fragile bones.

Lead

Lead is a natural element that is persistent in water and soil. Most of the lead in the environment is from human sources as the result of smelting and historical use in paints and gasoline. Human exposure occurs primarily through ingestion of food, water, dirt and paint chips and by breathing in dust that contains lead.

Although similar adverse nervous systems effects occur in adults and children, children are more sensitive to lead exposure than are adults. High levels of exposure to lead can kill children. Children who survive high levels of lead exposure suffer permanent severe mental disorders.

metals in surface water and sediment along the South Platte River. These evaluations were performed by comparing the trace metal concentrations at OU2 to benchmark values that are believed to be without significant risk of unacceptable adverse effects.

The SLERA found few locations where concentrations of arsenic and lead in surface soil could currently be toxic to plants. Most of the locations that are of potential concern are in subsurface soils. Therefore, the predicted risks are not currently of concern, but could be of concern if soils became exposed and subsurface materials were brought to the surface.

The levels of metals detected in surface water at both upstream and downstream sampling locations along the South Platte River were less than benchmark values. This indicates that any impacts of groundwater discharging from OU2 to the South Platter River are not of ecological concern.

Environmental Justice Concerns

Community input is very important to EPA. EPA and CDPHE recognize that the VB/I-70 site is an Environmental Justice site because the community is predominately low-income and minority. These types of communities may be disproportionately affected by environmental impacts from many sources including industry and other Superfund sites.

Remedial Action Objectives

Remedial Action Objectives (RAOs) are goals developed by EPA to protect human health and the environment. These RAOs are the overarching goals that all cleanup activities selected for OU2 should meet. EPA considers current and future land use of the site when determining RAOs. Commercial/industrial is the primary current use and the reasonably anticipated future land use for OU2.

However, the Human Health Risk Assessment also included evaluation of potential hypothetical future residential use of OU2 in the event that the site was ever redeveloped from a commercial/ industrial use to residential use. This evaluation was conducted in part to evaluate potential risks if land uses at the site were unrestricted, and in part, at the request of CCoD, to allow for evaluation of what actions might be necessary should the land use at OU2 ever change in the future.

As discussed previously, surface and shallow subsurface soil media are of concern at OU2. The following preliminary RAOs have been identified for OU2.

1. Limit exposure of commercial and construction workers to lead; and

2. Limit or prevent exposure of potential future residential users to lead and other metals (arsenic, manganese, and thallium).

Summary of Remedial Action Alternatives

Remedial alternatives for the VB/I-70 site are presented in this section.

In evaluating potential future activities at the site, the final condition of the remediated area must be considered. For each of the alternatives evaluated, **institutional controls (ICs)** would be implemented to prevent unacceptable future human exposure to contaminated soil and to prevent disturbance of the selected remedy. ICs are community protective measures such as restrictive covenants, zoning ordinances, easements, deed restrictions and building permits. ICs would be developed in cooperation with local government to ensure that future land uses are consistent with the selected remedy.

Alternative 1: No Action

EPA is required pursuant to 40 CFR §300.430(e)(6) to evaluate the No Action Alternative. Under this alternative, no engineered measures or monitoring would be implemented to reduce contaminant concentrations, prevent chemical migration, restrict or eliminate potential exposures to site chemicals, or reduce exposure of chemical concentrations to potential humans. This alternative is not protective of human health or the environment and does not comply with the RAOs. The No Action Alternative provides a baseline for evaluation/comparison of the costs and benefits of other alternatives.

Cost: No costs are associated with the No Action Alternative, as no remedial actions would be implemented.

Alternative 2: Institutional Controls

ICs would be developed, applied and maintained under Alternative 2. The objective of the ICs to be developed and implemented under this alternative are expected to include the following:

- Prevent residential land use by restricting land uses to commercial or industrial uses in areas where residual contamination will remain at concentrations above levels that would otherwise allow for unrestricted use.
- Require appropriate health and safety and materials management procedures for any excavations conducted in conjunction with subsurface infrastructure upgrades, repairs or replacements in areas of residual contamination
- Require implementation of appropriate remedial actions in conjunction with any building demolition or redevelopment activities that may occur in the future in the areas of residual contamination.

Under Alternative 2, the risks would be reduced and controlled through implementation, monitoring, and enforcement of ICs that would only allow land uses compatible with the presence of the types of residual contaminants of concern in soil and would restrict use of the land that could result in exposure to residual contaminants of concern at levels that could pose an unacceptable risk.

Costs:	
Capital Cost:	**$ 31,000**
Monitoring Costs/Year:	**$2,000**
30-year Present Worth Cost:	**$70,000**

Alternative 3: Capping

Soil sample locations at OU2 where concentrations of lead in surface and subsurface soil 0 to 5 feet deep exceeding the 800 mg/kg action level will be capped to prevent exposure by commercial workers. The majority of OU2 is covered by existing paved surfaces or buildings. For this alternative, it is assumed that cracks existing in these paved surfaces would be sealed. Asphalt pavement or another form of surface cap would be placed over those areas that are currently not covered by a paved surface.

Following the crack sealing, the areas would be seal-coated every five years and a resurfacing overlay would be placed over those areas that are currently not covered by a paved surface. In addition, Alternative 3 would include the IC components described as part of Alternative 2.

Costs:	
Capital Cost:	**$1,680,000**
Monitoring Costs/Year:	**$2,000**
30-year Present Worth Cost:	**$1,450,000**

Alternative 4: Excavation/Disposal of Soil

Alternative 4 would involve the excavation and subsequent disposal of contaminated soil containing lead at concentrations greater than 800 mg/kg. This volume of soil is estimated to be approximately 160,000 cubic yards. There are some areas in OU2 where soils proposed for excavation are immediately accessible and other areas where the presence of buildings and other site structures limit access to the contaminated soil. For those areas where access is currently limited, excavation of soil would be implemented as a part of future property redevelopment after buildings and site structures are demolished.

Potentially contaminated soil would be trucked to the Denver-Arapahoe Disposal site (DADS), a permitted solid waste disposal facility in Arapahoe County, Colorado. Following excavation, approximately 205,000 loose cubic yards of clean fill would need to be trucked to OU2 for backfill. The open excavations would be backfilled and compacted. It is assumed that an asphalt cap would be placed over the excavation areas after they are backfilled.

Alternative 4 would include the IC components for restriction of residential land use as described as part of Alternative 2. This would apply to areas where contaminants are located in soil beneath some buildings and other structures, until a time when areas are redeveloped.

Costs:	
Capital Cost:	**$11,320,000**

Monitoring Costs/Year:	**$2,000**
30-year Present Worth Cost:	**$8,600,000**

Evaluation of Remedial Alternatives

Nine criteria are used to evaluate the different remediation alternatives, individually, and against each other. The nine evaluation criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. During the evaluation of remedial alternatives, the alternatives are initially evaluated according to the threshold criteria, which must be met. Then the alternatives are compared with each other to identify relative advantages and disadvantages among the different balancing criteria and modifying criteria. The purpose of the comparative analysis is to provide information for a balanced remedy selection.

Threshold Criteria

Alternatives must, at a minimum, meet the first two criteria to be eligible for selection as the preferred alternative.

1. **Overall Protection of Human Heath and the Environment** considers whether or not an alternative provides adequate protection by eliminating, reducing, or controlling unacceptable risks.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARS)** considers whether or not an alternative will meet all federal or state standards required by environmental laws or whether there is justification for waiving the standards.

Primary Balancing Criteria

The primary balancing criteria are used to weigh effectiveness and cost tradeoffs among alternatives and the main technical criteria upon which the alternative evaluation is based.

3. **Reduction of Toxicity, Mobility, and Volume through Treatment** indicates EPA's preference for alternatives that include treatment processes to lower or eliminate the hazardous nature of material, its ability to move in the environment, and the amount left after treatment.

4. **Long-Term Effectiveness and Permanence** considers the long-term effectiveness and permanence of maintaining the protection of human health and the environment after implementing each alternative.

5. **Short-Term Effectiveness** considers the effect of each remedial alternative on the protection of human health and the environment during the construction and implementation phase.

6. **Implementability** considers the technical and administrative feasibility of implementing each alternative and the availability of the services and materials required during implementation.

7. **Cost** considers construction costs as well as long-term operation and maintenance costs of each alternative by considering whether more costly alternatives provide additional public health benefits for the increased cost.

Modifying Criteria

The last two criteria are used to determine whether the concerns of the state and the public should modify EPA's approach to the cleanup of OU2.

8. **State Acceptance** considers whether the state agrees with, disagrees with, or has no comment on EPA's preferred alternative.

9. **Community Acceptance** considers the concerns or support the public may offer regarding each alternative. EPA will evaluate community acceptance of cleanup alternatives after receiving public comment on the propose plan.

Summary of the Preferred Alternative

Alternative 3 – Capping with Institutional Controls

The preferred alternative for Operable Unit 2 is Capping with Institutional Controls. Based on the information currently available, EPA and the State of Colorado believe the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria.

The majority of OU 2 is covered by existing pavement and buildings. Areas not covered by pavement or buildings that would require a cap are identified in Figure ?. Figure ? also shows existing paved areas that would require sealing of cracks.

Because hazardous substances, pollutants, or contaminants will remain on site above health-based levels that allow for unlimited use and unrestricted exposure, a review will be conducted within five years after initiation of remedial action. This will ensure that the remedy is protective of human health and the environment. If EPA and the State determine the remedy is not protective, a different remedy would be developed and implemented.

The preferred alternative may change in response to public comment or new information. For this reason, EPA and the State of Colorado encourage the public to review and comment on all the alternatives presented in this proposed plan.

Community Participation

EPA and CDPHE provide information regarding Operable Unit 2 of the VB-I-70 site through fact sheets, one-on-one meetings, announcements in the Denver Post, EPA's web site and the information repository containing the Administrative Record. The information repository is located at the Valdez-Perry Library.

EPA and CDPHE encourage citizens to comment on this proposed plan Please see page one for information about how you can comment and for details about a public meeting.

Note: we need the newer version of this table in Word format.

Evaluation of Remedial Alternatives for VB/I-70 OU2

		Evaluation Criteria	1 No Action	2 Institutional Controls	3 Capping and Institutional Controls	4 Soil Excavation and Institutional	Notes
Threshold	1	Protection of Human Health and the Environment	●	●●●	●●●	●●●	All alternatives except No Action would be protective of Human health.
	2	Compliance with ARARs	●	●●●	●●●	●●●	There are no chemical-specific ARARs for lead and arsenic in soil. No location-specific ARARs were identified. All alternatives would comply with action-specific ARARs.
Primary Balancing	3	Long-term Effectiveness	●	●●	●●●	●●●	Soil excavation and offsite disposal provides the greatest degree of effectiveness and permanence followed by capping. Institutional controls are the least effective and permanent.
	4	Reduction of Toxicity, Mobility, or Volume through Treatment	●	●●	●●	●●●	None of the alternatives include treatment.
	5	Short-term Effectiveness	●	●●●	●●	●●	Excavation and offsite disposal poses the greatest short-term risks to the community and workers.
	6	Implementability	●●●	●●	●	●	Soil excavation would be more difficult to implement and could not be fully implemented until buildings are removed as part of future redevelopment.
	7	Cost	●●●	●●●	●	●	Soil excavation would not provide a substantial increase in overall protection for the increased cost.
Modifying	8	State Acceptance					CDPHE acceptance will be evaluated at the close of the Public Comment Period.
	9	Community Acceptance					Community acceptance will be evaluated at the close of the public comment period.

Legend for Qualitative Ratings System: Performance of Alternatives: Low ● Moderate ●● High ●●●

Map to go here

Useful Terms

Understanding environmental cleanup can be daunting for the average person. The following are definitions of commonly used terms at the Libby Asbestos Site to aid your understanding of this document.

Applicable or relevant and appropriate requirements (ARARs). Any state or federal statute that pertains to protection of human life and the environment in addressing specific conditions or use of a particular cleanup technology at a Superfund site.

Exposure. The amount of pollutant present in a given environment that represents a potential health threat to living organisms.

Exposure Pathway. The path from sources of pollutants via, soil, water, or food to man and other species or settings.

Feasibility Study (FS). The FS is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. It is conducted concurrently with the RI.

Five-Year Review. Remedial actions that result in hazardous substances, pollutants, or contaminants remaining at a site above levels that allow for unlimited use and unrestricted exposure are required to be reviewed every five years to ensure protection of human health and the environment.

ICs and Engineered Controls. ICs are actions, such as restrictive covenants, zoning ordinances, easements, deed restrictions, and building permits, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. Engineered controls are physical controls, such as fencing. Both types of controls are used to help preserve the integrity of the remedy.

National Priorities List (NPL). EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. A site must be on the NPL to receive money for remedial action.

Operable Unit (OU). A designation based on geography or other characteristics that defines a specific area of a site and enables the Superfund process to move forward in different areas at different times, speeding up the overall cleanup process at the site.

Operation and Maintenance (O&M). Activities conducted after a Superfund site action is completed to ensure that the action is effective for the long-term.

Present Worth. The present value (of a sum payable in the future) calculated by deducting interest that will accrue between the current and future date.

Remedial Investigation (RI). The investigation phase of the Superfund process that determines the nature and extent of contamination and assesses the risk to human health and the environment.

Remedial Action (RA). The actual construction or implementation phase of a Superfund site cleanup that follows remedial design. The remedial design is the design phase of a Superfund site cleanup that follows the signing of the ROD and precedes the RA..

Record of Decision (ROD). A public document that explains which cleanup alternative(s) will be used at NPL sites.

Superfund. The program that funds and carries out EPA solid waste emergency and long-term removal and remedial activities. These activities include establishing the NPL, investigating sites for inclusion, determining priority, and conducting and/or supervising cleanup and other actions.

Contacts

For more information, please feel free to contact the following representatives:

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